ROBINSON, BENJAMIN LINCOLN. 1917. A Monograph of the Genus *Brickellia*. Mem. Gray Herb. I. (*B. grandiflora*, pp. 111-113.)

DE SCHWEINITZ, LEWIS D. 1822. Attempt of a monograph of the Linnaean genus Viola, comprising all the species hitherto observed in North-America. Amer. Journ. Sci **5**: 48-81. (*V. bicolor*, p. 78.)

SHINNERS, LLOYD H. 1941. Notes on Wisconsin grasses — II. *Muhlenbergia* and *Sporobolus*. Amer. Midl. Nat. **26**: 69-73. (*Sporobolus neglectus*, pp. 70-71; *S. vaginiflorus* var. *inaequalis*, p. 71.)

———. 1951. The North Texas species of *Mirabilis* (Nyctaginaceae). Field & Lab. **19**: 173-182.

———. 1958. Spring Flora of the Dallas-Fort Worth Area, Texas. (*Viola bicolor*, p. 271.)

THE GENUS OLEANDRA OF COSTA RICA

EDITH SCAMMAN

This paper is the third of my studies of a genus of Costa Rican ferns, and follows the same plan as the previous ones on *Adiantum*[1] and *Pteris*.[2]

Again I want to express my gratitude to Dr. Leslie R. Holdridge of San José for his great help during my seasons of collecting in Costa Rica, and to Dr. Rolla M. Tryon of Harvard University for his advice and assistance so generously given in the preparation of these papers.

The drawings have been prepared especially for this article by Miss Ruth Hsu.

OLEANDRA Cavanilles

Oleandra is an isolated genus and is considered to be an old one. It is restricted almost entirely to the Tropics with numerous species in Asia to Polynesia, Africa, West Indies and Central and South America. The fronds are simple and entire, usually lanceolate-elliptical and firm, often lustrous in texture resembling the leaves of the Oleander, whence the name.

In some species the rhizome is stout (with appressed scales) and more or less erect, producing a shrubby growth habit. In others it is more slender (with spreading scales) and twines about tree trunks. The stipes are articulate (the portion below the joint being called a phyllopodium) and short or long, solitary or clustered. Veins are free (Fig. 3),

[1]Contrib. Gray Herb. **187**: 3-22. 1960.

[2]Rhodora **63**: 194-205. 1961.

and the round dorsal sori are borne irregularly in a row or rows, generally near the costa (Fig. 1), with orbicular or reniform indusia. The scales on the costa of some species are characteristic and serve as an aid to identification.

The treatment and key have been adapted from Maxon, Contr. U. S. Nat. Herb. **17**: 392-398. 1914.

KEY TO THE SPECIES

a. Rhizomes slender, the spreading scales not entirely concealing the rhizome (Fig. 2); phyllopodia usually long (0.5-3 cm.), slender and naked (except at the base), like the upper portion of the stipe. b.
b. Rhizomes brownish with a rather dense covering of persistent scales; leaf-tissue subcoriaceous. .....1. *O. articulata.*
b. Rhizomes pruinose with fewer, more laxly spreading, deciduous scales; leaf-tissue membrano-papyraceous. ..... 2. *O. Bradei.*
a. Rhizomes stout, pruinose, the appressed scales strongly imbricate, completely concealing the rhizome (Fig. 6); phyllopodia short (rarely to 0.5 cm. or a little more), stout and scaly at least at first, like the rhizome. c.
c. Stipes 0.5 to 2 cm. long above the articulation, the fronds variable in size and shape, narrowly or abruptly cuneate at base, minutely glandular-pubescent beneath, but soon glabrous; indusia not ciliate, nearly glabrous. ..... 3. *O. costaricensis.*
c. Stipes wanting or nearly so above the articulation, never more than 0.5 cm. long, the frond tapering downward to a long-attenuate, alate base, minutely pubescent; indusia long-ciliate and pilose. ..... 4. *O. decurrens.*

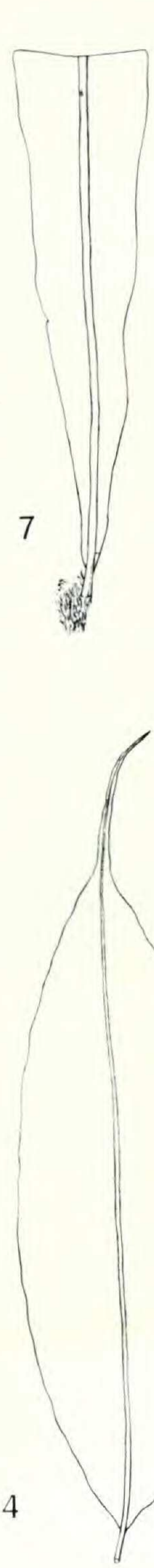
1. **Oleandra articulata** (Swartz) Presl, Tent. Pterid. 78. 1836. FIGS. 1-3.

Oleandra nodosa (Willd.) Presl, Tent. Pterid. 78. 1836.

Of the four species of Oleandra collected in Costa Rica this is the only one of widespread distribution, occurring in the West Indies and Central and South America; two of the others seem to be endemic to Costa Rica.

Climbing up the trunks of trees in the forest, the wide-creeping, brownish rhizomes are densely covered with spreading, ferruginous, linear-filiform scales with a dark-centered peltate base. The fronds, lance-linear to oblong-acuminate, caudate at the apex, are glabrous and shining.

FIG. 1-3. *Oleandra articulata* (from *Scamman 7600*): Fig. 1. leaf and portion of rhizome, × ½. Fig. 2. portion of rhizome, × ¾. Fig. 3. venation, × ¾. FIG. 4. *O. Bradei* (from *Scamman & Holdridge 7886*): lamina, × ½. FIG. 5-6. *O. costaricensis*



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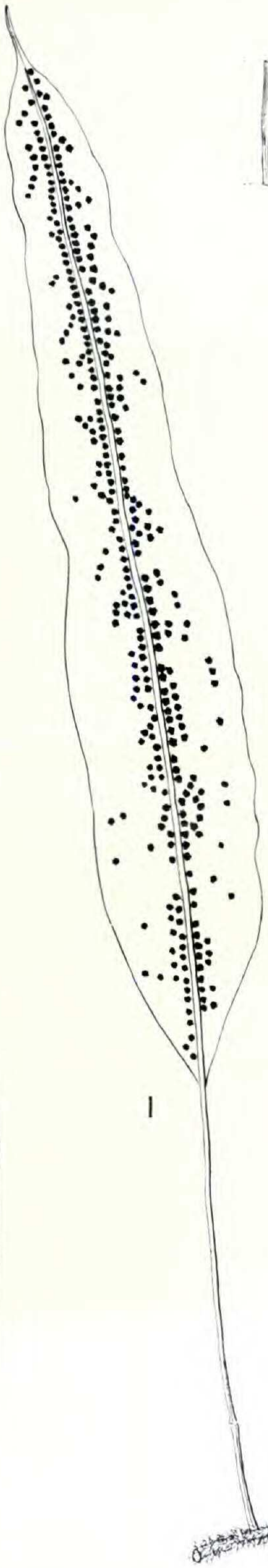

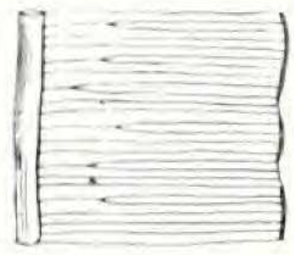

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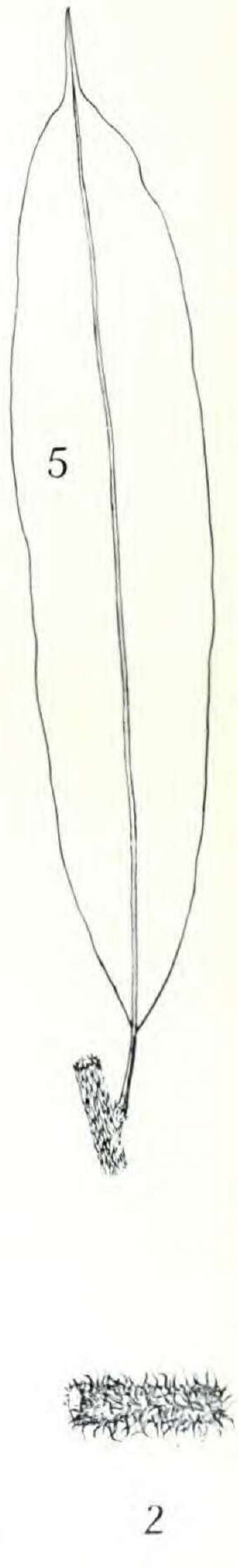

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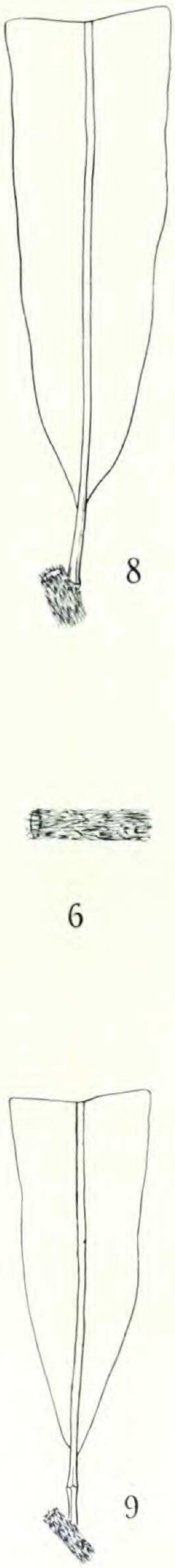

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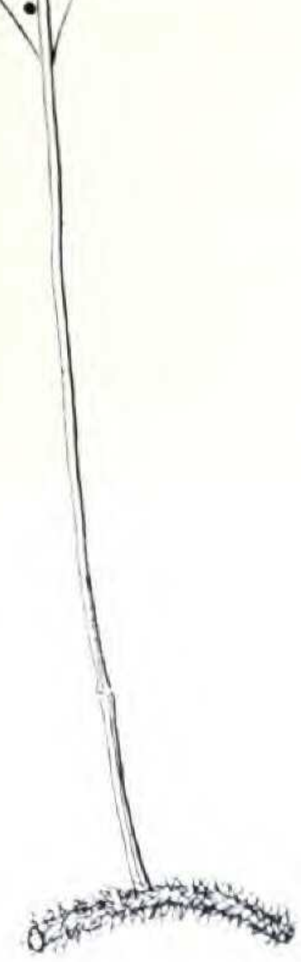

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(from *Scamman 7604*): Fig. 5. leaf and portion of rhizome, × ½. Fig. 6. portion of rhizome, × ¾. FIG. 7. *O. decurrens* (from *Brenes 14240*): portion of leaf and rhizome, × ¾. FIG. 8. *O. panamensis* (from *Pittier 5322*): portion of leaf and rhizome, × ¾. FIG. 9. *O. guatemalensis* (from *Tuerckheim 983*): portion of leaf and rhizome, × ¾.

The costae are elevated beneath, with cordate, deltoid to long triangular, castaneous scales.

Guatemala to Panama, to Bolivia and Brazil; West Indies. In moist forests from sea level to 1200 m.

Specimens seen: Cocos Island (Pacific): *Waldo L. Schmitt 132* (US), *A. Stewart 239* (GH). HEREDIA: Finca La Selva, Río Puerto Viejo, *Scamman & Holdridge 7884* (GH). CARTAGO: San Juan del Norte, *Scamman 7600* (GH).

2. **Oleandra Bradei** Christ, Bull. Soc. Bot. Genève II, **1**:231. 1909. FIG. 4.

Based on *Oleandra nodosa*, var. *caudata*, Christ, Bull. Herb. Boiss. II, **4**:964. 1904. Type: Talamanca, Costa Rica, 1000 m., 1898, *Pittier 12699*.

Oleandra Bradei has been collected often in Costa Rica, especially in the region of La Palma. The whitish rhizomes and their fewer, more deciduous, reddish-brown, lanceolate scales distinguish this from the former species. The fronds are generally wider and of thinner texture than those of *O. articulata*. The often ovate-elongate blade, with undulate margins is variable in size and shape. The costa in the specimens seen, has substantially no scales.

Known only from Costa Rica. On mossy tree trunks at edge of forests from 300 to 2500 m.

Specimens seen: LIMON: Los Diamantes, Rubber Plant Station, *Scamman 7041* (GH); Hamburg Finca, on the Río Reventazón below Cairo, *Standley & Valerio 48691* (US.). ALAJUELA: Zarcero, *Austin Smith 48/194* (US); La Palma de San Ramón, *M. Quiros 264* (GH), La Palma near San Ramón, *A. Brenes 5113* (US). SAN JOSE: Las Nubes, Jan. 30, 1938, *Wm. Knight* (US), *Scamman & Holdridge 7885* (GH); La Palma, *Standley 33066* (GH, US), *38188* (US), *Maxon 389,404* (US), *H. E. Stork 420* (US), *H. Berlolini 608* (US), *Scamman 7601* (GH); On the Road to La Hondura, *Maxon & Harvey 7904* (GH, US), *Scamman & Holdridge 7886* (GH), *Standley 37911* (US). CARTAGO: Navarrito, *Lankester 750* (US).

3. **Oleandra costaricensis** Maxon, Contr. U. S. Nat. Herb. **17**:397. 1914. FIGS. 5-6.

Type: La Palma, Costa Rica, 1459 m., September 1898, *A. Tonduz 12551* (US).

This species, the most common in Costa Rica, belongs to

the second group of Oleandras with the stout, woody rhizome (covered with closely appressed scales) growing more or less erect on forest trees or on bushy banks. The fronds are at first minutely glandular-pubescent beneath, lustrous in texture and often iridescent. The sori are rather large with nearly glabrous indusia. The scales on the costa are characteristic, reddish brown, deltoid to ovate-lanceolate, and deeply lacerate.

Costa Rica, also Colombia. On roadside banks or climbing high on trees in moist forests, the stems sometimes supported by other plants, from 600 to 1700 m.

Specimens seen: 1901-1905, *Wercklé* (US); Nov. 1886, *J. J. Cooper* (GH, US). LIMON: On hills near Moravia, *Williams 16181* (US). HEREDIA: Cinchona, *Scamman 7604* (GH). SAN JOSE: La Palma, *Tonduz 12550* (US), *Standley 38229* (US), *Scamman 7602* (GH); La Hondura, *Standley 36210* (US); Vicinity of El General, *Skutch 2817, 2961* (GH, US). CARTAGO: Orosi, finca del Dr. Valverde, *A. Brade 16836* (US), Vicinity of Orosi, *Standley 39611* (US); Tapanti (Orosi), *R. Torres 185* (US), *Scamman & Holdridge 7887* (GH); Juan Viñas, *Cook & Doyle 222* (US), *Holdridge 7603* (GH); La Estrella, *Standley 39259* (GH, US), *39393* (US); East Turrialba, Aug. 9, 1924, *A. Alfaro* (GH, US); El Muñeco, on Río Navarro, *S. & R. Torres 50991* (US); La Fortuna entre Cervantes et Pacayas, March 1906, *Biolley* (US); Pejivalle, *Stork 2819* (US); San Isidro de Cartago, *Stork 4529* (US). GUANACASTE: La Tajana, north of Tilarán, *Standley & Valerio 45928* (US), El Silencio near Tilarán, *Standley & Valerio 44702* (US).

4. **Oleandra decurrens** Maxon, Contr. U. S. Nat. Herb. 17 :396. 1914. FIG. 7.

Type: El General, Costa Rica, January 1897, *Pittier 10649* (US).

This rare species has the stipe almost lacking, never more than 0.5 cm. long, the linear-oblanceolate, pubescent fronds tapering gradually downward to a slender, long-attenuate, alate base. The indusia are small and long-ciliate, and the many scales on the costa are linear-lanceolate, long-attenuate and bright brown. The leaf-tissue is rigidly herbaceous.

Known only from Costa Rica. From 1100 to 1500 m.

Specimens seen: ALAJUELA: Des collines de Piedades près San Ramón, *A. Brenes 14240* (GH, US). SAN JOSE: El General, *Pittier 10649* (US).

One variety described from Costa Rica has not been

placed. Although described under *O. trinitensis* it is probably *O. costaricensis*.

O. trinitensis Maxon, var. *subcostaricensis* Suesseng. & Losch, Mitteil. Bot. Staats. München **1**: 23. 1950. Type: Turrialba, Costa Rica, 1500 m., June 18, 1932, *Kupper 1613*, not seen.

Two other species, *Oleandra guatemalensis* Maxon and *Oleandra panamensis* Maxon grow in Guatemala and in Panama to Colombia respectively. These might possibly occur in Costa Rica, although no specimens of them have been seen from there.

O. panamensis (Fig. 8) differs from the related *O. decurrens* in having the lamina base rather abrupt and the leaf distinctly stipitate above the articulation. In *O. decurrens* the lamina base is gradually reduced and the leaf is subsessile or nearly so above the articulation.

O. guatemalensis (Fig. 9) has long slender phyllopodia like the upper portion of the stipe and small distinctive heart-shaped, almost concolorous scales at the sides of the costa. It differs in these characters from *O. costaricensis* which has the phyllopodium like the rhizome and more elongate, deeply lacerate costal scales. — GRAY HERBARIUM, HARVARD UNIVERSITY.

VASCULAR PLANTS ON THE CINDER CONE OF PARICUTIN VOLCANO IN 1960[1]

JOHN H. BEAMAN

Plants growing on the cinder cone of Parícutin Volcano in 1958 have been reported previously (Beaman, 1960). The present study is based on collections made there on September 8, 1960, two years after the first visit and approximately eight and a half years after volcanic activity ceased. Voucher specimens are filed in the Herbarium of Michigan State University. I am indebted to Dr. R. L. Hauke, Dr. R. McVaugh, Dr. T. R. Soderstrom, and Dr. W. H. Wagner, Jr. for help in the determination of certain species as indicated below.

Ascent and descent of the cone were made on the southwest side. The entire circumference of the rim and both

[1]Supported by Grant G-9045 from the National Science Foundation.